

Branch Name:	Signal Processing and Communication
ProgramCode:	ET214
CourseName:	Research Methodology And Technical Communication
CourseCode:	2ET2000101T
Pre-requisiteCourse:	- NONE -

Course Objectives:

The prime objective of this course is to bring research orientation amongst the post graduate scholars. The course aims to acquaint the scholars with essentials of research methodology and technical communication. Particularly, the course aims at introducing them to the basic concepts used in engineering research and technical drafting. It also aims to provide technical communication required for various subjects such as projects, seminars and dissertation during presentation, report/paper writing, defending their work etc. Some other objectives of the course are:

1. To understand of the fundamental structure of research procedure.
2. To understand of various research designs and techniques involved in engineering.
3. To identify various sources of information for literature review and data collection.
4. To understand the drafting technical documentation including research paper/thesis/articles/reports.
5. To understand issues such as ethics, internet communication, gender & diversity issues etc. pertaining to technical communication.

Teaching and Examination Scheme:

Credit	Teaching Scheme Hours per week				Evaluation Scheme (Marks)								
					Theory (Marks)				Practical (Marks)				Total (Marks)
	L	T	P	Total	SEE		CCE		SEE		CCE		
					Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
2	2	-	-	2	-	-	16	40	-	-	-	-	40

Course Contents:

Sr. No	Topic	Total Hours	Weightage (%)
1	Research Process Overview: Understanding the language of research – Concept, Construct, Definition, Variable. Research Process.	3	12%
2	Problems and Hypotheses – Defining the research problem, Formulation of the research hypotheses, The importance of problems and hypotheses	3	11%
3	Research design – Experimental and Non-experimental research design, Field research, Survey research. Qualitative and Quantitative Research	3	11%
4	Methods of data collection – Secondary data collection methods, qualitative methods of data collection, and Survey methods of data collection. Research data analysis and representation (plot, figures, tables, errors bars)	3	11%
5	Essence of Technical Communication: Analogy of Question/Answer to Problem/Solution. Steps in technical communication and practical guidelines.	3	11%
6	Organization of technical report: Title, Authors, Affiliation, Abstract, Introduction, Literature survey, Methods, Result, Discussion, Conclusion, References.	3	11%

7	Three pass reading. Effective communication – Teacher/Student perspective. Listening – Hearing Vs. Listening. Notes Taking. Elevator Pitch. Technical writing.	3	11%
8	Wisdom of Internet Communication. Gender and diversity issues and stereotypes used in technical communication.	3	11%
9	Ethical issues in engineering research	3	11%

Review Presentation: The student is expected to spend minimum 2 hours per week (as mentioned in the teaching and evaluation scheme) to carry out list of assignment mentioned beneath related to the area of your interest. Student is supposed to view various video lectures (E.g. NPTEL) available in the domain identified. Student is required to make a review-presentation on the work carried out for the same.

Text Books:

1. C. R. Kothari, “Research Methodology: Methods and Techniques”, New Age International Publishers.

Reference Books:

1. Raman, Meenakshi and Sangeeta Sharma, “Technical Communication: Principle and Practice”, Oxford University Press.

List of References:

1. <http://dl.acm.org/>
2. <http://springer.com/>
3. <http://sciencedirect.com/>
4. <http://elsevier.com/>
5. <http://ieeexplore.ieee.org/>
6. <https://scholar.google.co.in/>
7. <https://www.scopus.com/>

E-Resources / Web Links

1. <http://courses.writing.ufl.edu/3254/Textbook/Lannon%20Instructor%20Manual%2012e.pdf>
2. <http://www.limat.org/data/research/Research%20Methodology.pdf>
3. http://www.sociology.kpi.ua/wp-content/uploads/2014/06/Ranjit_Kumar_Research_Methodology_A_Step-by-Step_G.pdf
4. <http://www.ndc.gov.ng/Lectures/Research-Methodology.pdf>

List of Assignments:

1. Searching criteria/techniques for relevant research papers (search by domain, time interval, keyword, title, author setc).
2. Understanding terminology such as Impact factor, H factor, Bibliography, References, Citation etc.
3. Identify 5 research papers of your interest preferably from above reference sites. Identify and understand the sections: Title, Authors, Affiliation, Abstract, Introduction, Literature survey, Methods, Result, Discussion, Conclusion, and References.
4. For the 5 research papers identified above,
 - a. Classify the abstracts among: General domain statement, problem/gap/challenge/issue in the domain, other researchers' work, authors' contribution, comparison of authors work with other, utility/applicability of the research, future scope.
 - b. Read the conclusion and compare with abstract.
 - c. Paraphrase (rewrite the same contents in your own words) for the abstracts.
 - d. Identify tools and techniques used by the authors for experimentation.
5. Understand the difference between paraphrasing and plagiarism.
6. Write an elevator pitch describing you and compare the same with your co-student.
7. Draft various emails such as (i) to your friend (ii) to your research supervisor (iii) to a company

for job application (iv) to an editor of a conference (v) to your principal, with relevant subjects. The emails should include (i) greetings and/or your introduction (ii) addressing the recipient (iii) signing off (iv) signature etc.

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	To understand the process of research	2 Understanding
CLO2	To identify problems in his/her domain	4 Analyze
CLO3	To define hypothesis and test it	3 Applying
CLO4	To collect data and analyze & process the data scientifically	4 Analyze
CLO5	To understand different components of research papers	2 Understanding
CLO6	To understand note taking, paraphrasing, elevator pitch, gender & diversity issues and ethical issues in technical communication	2 Understanding

Mapping of CLOs with POs & PSOs

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes (PSOs)			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CLO1											M	M				
CLO2											M	M				
CLO3											M	M				
CLO4											M	M				
CLO5											M	M				
CLO6											M	M				

H: High, M: Medium, L: Low